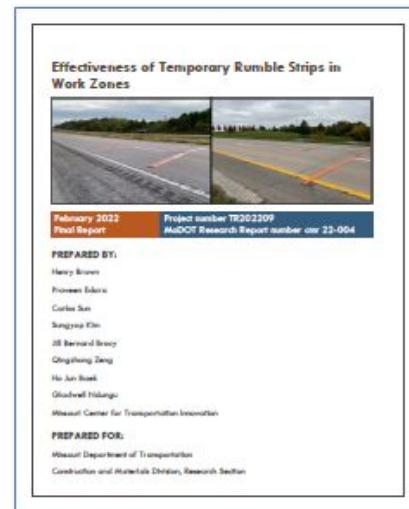


Research Summary

Effectiveness of Temporary Rumble Strips in Work Zones

A significant component of any strategy to improve work zone safety includes managing work zone speeds. Long-term and short-term temporary rumble strips are used by the Missouri Department of Transportation (MoDOT) to reduce vehicle speeds in work zones and alert drivers as they approach a work zone. The objective of this research study is to investigate the effectiveness of temporary rumble strips used by MoDOT and other state Departments of Transportation (DOTs). The research methodology includes a review of existing literature, synthesis of MoDOT and other DOT practices, field observations of driver behavior and installation of temporary rumble strips, collection and analysis of speed data, and economic analysis. The project scope includes both short-term temporary rumble strips, which are held in place by their weight and removed during inactive work zone periods, and long-term temporary rumble strips, which are held in place by adhesive and remain in place during active and inactive work zone periods.

The results of an analysis of existing DOT practices for temporary rumble strips indicate that there are significant differences among DOTs with respect to level of implementation and attributes such as size, color, speed, spacing, materials, installation, maintenance, and removal. DOTs generally find that temporary rumble strips are effective in reducing vehicle speeds and alerting drivers to the presence of



work zones. Prior research studies have shown temporary rumble strips to be effective in reducing vehicle speeds, alerting drivers to the presence of the work zone, and reducing crashes. Concerns noted by some DOTs include the heavy weight of short-term temporary rumble strips, requirements for installation, potential for erratic driver behavior, and the maintenance needs of temporary rumble strips.

"Overall, the study found temporary rumble strips can be an effective tool to lower vehicle speeds and reduce crashes."

Results from field observations of temporary rumble strips at five work zones indicated the spacing between strips and/or number of strips deviated from the MoDOT Engineering Policy Guide (EPG) at four of five work zones. Perceptions of the effectiveness of temporary rumble strips varied between the installers, but the most generally found the strips effective. Concerns noted by installers include the heavy weight of short-term temporary rumble strips and worker exposure to traffic when installing rumble strips on a divided highway. The research team also observed driver behavior for four hours after installation at three work zones. Only one erratic driving maneuver, in which a motorcycle drove around short-term temporary



rumble strips in a flagger work zone, was observed.

To assess the effects of temporary rumble strips on managing vehicle speeds, vehicle speed and count data were collected at 18 work zones and analyzed. The analyses revealed positive effects of temporary rumble strips on the work zone speed compliance. Marginal effects of the rumble strips showed that speed violation decreased by 21.2 and 18.2 percent for short-term and long-term rumble strips, respectively. However, the analyses were inconclusive on the difference between short-term and long-term rumble strips' effects on the work zone speed violation and compliance.

Findings from an economic evaluation suggest that temporary rumble strips lead to a reduction in work zone crashes, rendering cost savings greater than any costs incurred. Some rural and urban examples with various levels of AADT resulted in benefit-cost ratios of 4.3 to 26.3.

Overall, the study found temporary rumble strips can be an effective tool to lower vehicle speeds and reduce crashes. Suggested modifications to existing MoDOT practices may improve the performance of temporary rumble strips and compliance with MoDOT standards. Language for possible inclusion in the EPG regarding selection of temporary rumble strip type is provided.



Figure 1: Short-term temporary rumble strips installed on US 63 southbound in Ashland

Project Information	
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